



## **Space Science & Astrobiology Division**

*Ames Center for Exoplanet Studies (ACES) Seminar*

# **Using Protoplanetary Disks to Weigh the Youngest Stars and Constrain the Earliest Stages of Stellar Evolution**

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N245 Conference Room 215

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**Abstract:** Mass is the fundamental property that determines the fate of a star. In particular, the masses of young stars are of great relevance to many astrophysical problems, including star and planet formation. We have developed a novel approach that combines spatially resolved sub-millimeter spectral line imaging and optical/near-infrared high resolution spectroscopy to derive the fundamental properties of a young star: mass, temperature, and radius. By applying our technique to a sample of pre-main sequence stars, we are mapping out a dynamically-calibrated Hertzsprung-Russell diagram for the express purpose of evaluating pre-main sequence evolutionary models. Looking forward, ALMA is poised to deliver precise stellar masses in statistically large quantities, enabling a meaningful survey of the fundamental properties of young stars.